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ABSTRACT

Traditional variables used to predict success in higher education have been classified as intellective factors. These so-called intellective factors include: high school grades, aptitude scores and I.Q. scores. Other significant variables used to predict grades are known as non-intellective factors. These non-intellective factors include concepts such as: motivation, study attitudes and personality characteristics. Since intellective factors account for approximately one-half of the variability in academic achievement, there has been a trend toward the use of non-intellective factors to explain the remaining variance. (Author)

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Predicting Academic Achievement Using Non-Intellective Factors: A Review of the Literature

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ABSTRACT

Traditional variables used to predict success in higher education have been classified as intellective factors. These so-called intellective factors include: high school grades, aptitude scores and I.Q. scores. Other significant variables used to predict grades are known as non-intellective factors. These non-intellective factors include concepts such as: motivation, study attitudes and personality characteristics. Since intellective factors account for approximately one-half of the variability in academic achievement, there has been a trend toward the use of non-intellective factors to explain the remaining variance.

There have been numerous studies conducted to predict student achievement in colleges and universities. Variables used are high school grades, aptitude scores, personality measures, and study habits inventories. Attempts have been made to identify the concept of motivation through personality measures and study habits inventories. It is generally accepted that aptitude variables or so-called intellective factors account for one-quarter to one-half of the variability in academic achievement (Crawford & Burnham, 1946; Lavin, 1965; and Khan, 1969). Recently attention has been given to non-intellectual factors, such as motivation, study habits and personality characteristics. Non-intellective predicators have been used to predict intellective criteria to a greater degree than was previously true (Yonge, 1965 and Richards, et al., 1967).

Fishman (1962) stated it is conceptually useful to distinguish between intellective and non-intellective predicators. Intellective predictors include aptitude and intelligence test scores, achievement test scores and high school rank or high school average. Non-intellective predictors include personality and motivational tests, interest inventories, interviews and personal ratings, biographical information, and study habits inventories.

EARLY STUDIES

The early studies on prediction used intellectual predictors (May, 1923; Odell, 1927; Harris, 1940; Crawford & Burnham, 1946; Stuit, et al., 1949; Fishman & Pasanella, 1960; Bloom & Peters, 1961 and Lavin,

1965). In 1923, May, who reported on the prediction of academic success, defined the criterion of academic success to be grades. It was assumed that the quality of intellectual work was measured in grades and quantity was measured by semester hours. The only defense for such assumptions is that these measures were available and generally accepted by the academic community. May (1923) used I.Q. scores as the independent variable and found that this type of intellectual measure is significantly related to academic success (GPA).

A massive review of factors affecting college grades was reported in 1940 by Harris (reviewed 328 studies from 1930 to 1937). Harris (1940) found the essential factors in student achievement to be ability (scholastic aptitude), effort (degree of motivation) and circumstances (personal, social, economic or academic). Fishman and Pansanella (1960) located 580 studies on college prediction between 1949 and 1959 and found the most usual predictors to be intellective (high school grades and scores on standardized aptitude tests).

Rose and Trent (1973) reported that previous grades are the predominant variable for predicting future academic achievement. Holland, et al., (1967) did research with 12,432 college freshman in 31 colleges and universities and found the best predictor of college academic accomplishment to be high school grades or some combination of high school grades and ACT scores. Katz and Norris (1972) found that scholastic aptitude scores plus previous coursework offer the most efficient predictors for guidance counselors. Astin (1971) used high school grades and aptitude scores to compose selectivity tables for 2,300 American colleges (to be used with high school seniors thinking of college).

NON-INTELLECTIVE FACTORS

Non-intellective predictors have been used to predict variability beyond that accounted for by intellective factors. Research conducted with personality factors as predictors has been somewhat disappointing (Lavin, 1965 and Brown, 1972). Elton (1970) reported no significant differences in personality traits between college age students and non-students. Cattell, et al., (1966) have reported low correlations between student achievement and scores on various personality scales. Burnham (1959) stated the gain in the multiple correlation upon adding a personality test score to one of the usual predictors (high school grades or aptitude tests) is usually less than .05.

Within the area of personality tests, subscales that attempt to identify motivation for academic work have been found to be associated with one and two-year GPA (Donnan, 1968 and Cattell & Butcher, 1968). Donnan (1968) found that the achiever personality scores from the Opinion Attitude and Interest Survey were about euqally efficient in predicting GPA as were the verbal and mathematics portion of the Scholastic Aptitude Test (SAT) and high school ranking. Donnan (1968) used 375 students at the University of North Carolina.

Cattell and Butcher (1968) claim that 25 percent of the variation in academic achievement is due to differences in motivation. In 1960, Holland reported on prediction of college grades from personality variables in an attempt to provide information for the development of a theory of academic achievement. Holland (1960) used 277 talented students and found non-intellective variables such as superego, persistence , and deferred gratification are useful in predicting and understanding the nature of the academic achiever. Berman (1971) found that the correlation of personality charac-

teristics with achievement shows a number of traits are relevant. They seem to be in the areas of motivation, sense of well being and indepedence. Weiss, et al., (1959) reported that the combination of motivation measures with academic ability measures yielded a better prediction of GPA than academic ability measures alone. In conclusion, Weiss, et al., (1959) stated that a combination of ability and motivation measures seem to be a powerful predictor of academic performance.

Finger and Schlesser (1965) presented evidence that suggests a student's academic motivation can be identified by the kinds of attitudes which have developed regarding the educational institution. An attempt to describe academic achievement motivation was made by Finger and Schlesser (1965) using their Personal Values Inventory (PVI). This dimension was not related to ability as measured by an aptitude test, but did predict college persistence. Finger and Schlesser (1965) have shown that the PVI accounts for as much variance in grades as does scholastic aptitude. In a sample of 50 colleges, the average correlation coefficient with first semester grades and the PVI was .40, which was the same as the correlation between the same grades and scores on the College Entrance Examination Board's Scholastic Aptitude Test. The average correlation between the aptitude test and the PVI was .10.

Iglinsky and Wiant (1971) attempted to explain the relationship between self-concept and GPA, but found no significant relationship. In a review of the literature on non-intellectual factors related to academic success, factors such as self-discipline, interpersonal relationships, self-concept, motivation and aspirations were conceived to be related to GPA (Iglinsky & Wiant, 1971). Iglinsky and Wiant (1971) used 150 students and

measured their self-concept with the Tennessee Self-Concept Scale.

There is evidence that attitudes toward study habits along with ability measures are better predictors of grades than either of the two measures applied separately (Carter, 1950; Brown & Dubois, 1964 and Brown & Holtzman, 1967). Brown (1972) stated that studies aimed at uncovering the study skills and academic attitudes that differentiate high scholarship from low scholarship have mostly found significant differences in motivational orientations rather than significant variation in study mechanics. Brown and Holtzman (1965) made an intensive survey of the how-to-study literature, and concluded that attitude and motivational characteristics were of greater importance than purely mechanical procedures of studying. An important consideration is the motivation to use effective study skills (Lavin, 1965).

Cronbach (1949) indicated that interest and attitude measures may be tapping a motivational factor. There have been numerous studies demonstrating a relationship between study habit attitudes and GPA (Michael & Reeder, 1952; Lavin, 1965; Yonge, 1965; Desiderato & Koskinen, 1969; Clark & Ammons, 1970; Dispenzieri, 1971; Michael, 1971; Brown, 1972 and Miller & Michael, 1972. These studies may be identifying a motivational factor within a stated attitude or interest to study. The concept of motivation is difficult to identify, yet it is often used to explain academic achievement. Bannatyne (1971) stated that, as a subject, motivation comprises one of the most controversial sections of psychology. Jones, et al., (1973) referred to motivation as a "conceptual charlady" widely used to sweep up variance in academic attainment unaccounted for by traditional variables.

Michael and Reeder (1952) stated that the major purpose of a study habits inventory is to measure scholastic success, but at the same time correlate as near to zero as possible with a measure of scholastic aptitude. "The fulfillment of such an objective would tend to maximize the extent to which such an inventory would make a unique contribution to the prediction of scholastic achievement--that is, a contribution over and above that rendered by one or more standard aptitude measures" (Michael & Reeder, 1952, p. 237).

Lavin's (1965) massive review of the prediction of academic performance indicated there have not been adequate controls for sex. Most studies are not concerned with the study of sex differences. Seashore's (1962) review of the literature found that women's grades tend to be better predicted from aptitude scores than men, particularly in the social studies area. This is a trend that is more pronounced at the college level than at the secondary educational level (Seashore, 1962). Likewise, Albelson (1952); Endler and Steinberg (1963); Lavin (1965) and Sampel and Seymour (1971) found that women are more predictable than men, when using correlations between intellective factors and GPA.

CONCLUSION

Prediction of college grades has been a popular topic in the past, and holds considerable interest for professionals within higher education. There is a trend toward the use of non-intellectual factors to improve upon predictions of achievement in college. The problem is to isolate these non-intellective factors so they can be measured. Concepts such as motivation and study attitudes are difficult to observe and measure.

Traditional variables used to predict GPA are high school grades and aptitude scores used separately or in combination. These intellectual factors have helped to explain approximately one-half of the variability in academic achievement, yet an equal amount remains unexplained. The use of non-intellectual factors has made a contribution in explaining academic success beyond the capability of traditional intellective measures.

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